

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)								DATE February 1999		
BUDGET ACTIVITY 3 - Advanced Technology Development				PE NUMBER AND TITLE 0603311F Ballistic Missile Technology				PROJECT 4091		
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
4091 Missile Electronics	7,485	15,955	0	0	0	0	0	0	0	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0

(U) A. Mission Description: This Advanced Technology Development program funds the development, and particularly the integrated demonstration, of advanced guidance, navigation, and control packages for ballistic missiles. These technologies are flown as Missile Technology Demonstration flights. Efforts directly support strategic force sustainment, space force applications, and space navigation. Also funded are upgrades for range and safety instrumentation for ballistic missiles. Emphasis is on technologies which increase safety, reduce maintenance, and improve reliability of the currently deployed intercontinental ballistic missile (ICBM) force at a lower life cycle cost. Future precision guidance and navigation technologies are demonstrated on sounding rocket and ICBM flights that support conventional ballistic missiles and hard and deeply buried target defeat capability technology needs. Note: This program was eliminated at the end of FY 1997; however, Congress added funds for Missile Technology Demonstration (MTD) flight testing and Radiation Hardened Electronics in FY 1998 and for Ballistic Missile Technology and Range Safety in FY 1999.

(U) FY 1998 (\$ in Thousands):

- (U) \$4,240 Developed advanced boost guidance technology to reduce current operations costs and improve reliability and maintainability of existing systems. Developed precision navigation systems for future ICBM-delivered conventional munitions. Began development, integration, and testing of advanced solid state navigation technology for ICBM and space applications.
- (U) \$250 Developed advanced navigation technology to support range instrumentation and improved safety requirements. Flight tested Global Positioning System (GPS)-based navigation packages coupled directly with Inertial Navigation Systems (INS) to improve the accuracy, range, and safety of ballistic missiles and space systems.
- (U) \$715 Developed radiation hardened analog circuit technology for missile guidance systems. Designed and fabricated a twelve-bit analog converter. Stimulated a new second source supplier for radiation hardened analog components.
- (U) \$2,280 Improved radiation hardened digital circuit fabrication processes to facilitate evolutionary missile technology. Established new design tools for miniaturizing radiation hardened computer components. Initiated design effort to decrease digital circuit size by 50% while keeping pace with commercial computer performance.
- (U) \$7,485 Total

Project 4091
Page 1 of 3 Pages
Exhibit R-2 (PE 0603311F)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 1999
BUDGET ACTIVITY 3 - Advanced Technology Development	PE NUMBER AND TITLE 0603311F Ballistic Missile Technology	PROJECT 4091

(U) FY 1999 (\$ in Thousands):

- (U) \$11,985 Develop technologies for integration of advanced Global Positioning System - Inertial Navigation System (GPS-INS) technology into ballistic missile guidance systems and range instrumentation to meet more stringent range safety requirements. Transition proven advanced technologies into range qualification test programs.
- (U) \$2,980 Enhance GPS-INS navigation technologies to improve performance during the plasma blackout phase of ballistic missile reentry by applying current GPS anti-jamming technologies to ballistic missile technologies, developing advanced anti-jamming antenna architectures, and extending radiation hardening technologies to ballistic missile electronics systems.
- (U) \$500 Develop technologies for evaluating the service life and aging properties of ballistic missile components and materials such as the component polymeric materials.
- (U) \$490 Identified as a source for SBIR.
- (U) \$15,955 Total

(U) FY 2000: Not Applicable.

(U) FY 2001: Not Applicable.

Project 4091

Page 2 of 3 Pages

Exhibit R-2 (PE 0603311F)

UNCLASSIFIED

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)					DATE February 1999																																																												
BUDGET ACTIVITY 3 - Advanced Technology Development	PE NUMBER AND TITLE 0603311F Ballistic Missile Technology				PROJECT 4091																																																												
<p>(U) B. <u>Budget Activity Justification:</u> This program is in Budget Activity 3, Advanced Technology Development, since it develops and demonstrates technologies for existing system upgrades and/or new system developments that have military utility and address warfighter needs.</p> <p>(U) C. <u>Program Change Summary (\$ in Thousands):</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="text-align: right; width: 10%;"><u>FY 1998</u></th> <th style="text-align: right; width: 10%;"><u>FY 1999</u></th> <th style="text-align: right; width: 10%;"><u>FY 2000</u></th> <th style="text-align: right; width: 10%;"><u>FY 2001</u></th> <th style="text-align: center; width: 10%;"><u>Total Cost Cont</u></th> </tr> </thead> <tbody> <tr> <td>(U) Previous President's Budget/FY 1999 PB</td> <td style="text-align: right;">7,537</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td></td> </tr> <tr> <td>(U) Appropriated Value</td> <td style="text-align: right;">8,000</td> <td style="text-align: right;">16,000</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Appropriated Value</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. Congressional/General Reductions</td> <td style="text-align: right;">-262</td> <td style="text-align: right;">-45</td> <td></td> <td></td> <td></td> </tr> <tr> <td> b. SBIR</td> <td style="text-align: right;">-202</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> c. Omnibus/Other Above Threshold Reprogrammings</td> <td style="text-align: right;">-51</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td> d. Below Threshold Reprogrammings</td> <td style="text-align: right;">0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Adjustments to Budget Year Since FY 1999 PB</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(U) Current Budget Submit/FY 2000 PB</td> <td style="text-align: right;">7,485</td> <td style="text-align: right;">15,955</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: center;">TBD</td> </tr> </tbody> </table> <p>(U) Significant Program Changes: Not Applicable.</p> <p>FY 1999: \$490 identified as a source for SBIR.</p> <p>(U) D. <u>Other Program Funding Summary:</u></p> <p style="padding-left: 20px;">(U) <u>Related Activities:</u></p> <ul style="list-style-type: none"> – (U) PE 0602204F, Aerospace Sensors. – (U) This project has been coordinated through the Reliance process to harmonize efforts and eliminate duplication. <p>(U) E. <u>Acquisition Strategy:</u> Not Applicable.</p> <p>(U) F. <u>Schedule Profile:</u> Not Applicable</p> <p>.</p>							<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost Cont</u>	(U) Previous President's Budget/FY 1999 PB	7,537	0	0	0		(U) Appropriated Value	8,000	16,000				(U) Adjustments to Appropriated Value						a. Congressional/General Reductions	-262	-45				b. SBIR	-202					c. Omnibus/Other Above Threshold Reprogrammings	-51					d. Below Threshold Reprogrammings	0					(U) Adjustments to Budget Year Since FY 1999 PB						(U) Current Budget Submit/FY 2000 PB	7,485	15,955	0	0	TBD
	<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>Total Cost Cont</u>																																																												
(U) Previous President's Budget/FY 1999 PB	7,537	0	0	0																																																													
(U) Appropriated Value	8,000	16,000																																																															
(U) Adjustments to Appropriated Value																																																																	
a. Congressional/General Reductions	-262	-45																																																															
b. SBIR	-202																																																																
c. Omnibus/Other Above Threshold Reprogrammings	-51																																																																
d. Below Threshold Reprogrammings	0																																																																
(U) Adjustments to Budget Year Since FY 1999 PB																																																																	
(U) Current Budget Submit/FY 2000 PB	7,485	15,955	0	0	TBD																																																												
<div style="display: flex; justify-content: space-between;"> Project 4091 Page 3 of 3 Pages Exhibit R-2 (PE 0603311F) </div>																																																																	

THIS PAGE INTENTIONALLY LEFT BLANK